



## SEQUENCE LISTING

<110> Fader, Gary M.  
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Odell, Joan T.  
Yu, Xiaodan

<120> Nucleic Acid Fragments Encoding Isoflavone Synthase

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<140> 09/857.581

<141> 2001-05-06

<150> PCT/US00/01,772

<151> 2000-01-26

<150> 60/117,769

<151> 1999-01-27

<150> 60/144,783

<151> 1990-07-20

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<151> 1999-09-24

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<170> PatentIn version 3.3

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Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met Pro Thr
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1040						1045					1050			
Thr	Gly	Cys	Ala	Cys	Cys	Cys	Ala	Cys	Cys	Ala	Cys	Thr	Cys	Cys
1055						1060					1065			
Cys	Ala	Gly	Thr	Gly	Gly	Thr	Cys	Ala	Ala	Ala	Ala	Gly	Ala	Ala
1070						1075					1080			
Ala	Gly	Thr	Gly	Cys	Ala	Cys	Ala	Gly	Ala	Ala	Gly	Ala	Gly	Thr
1085						1090					1095			
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1115						1120					1125			
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1145						1150					1155			
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1160						1165					1170			
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1220						1225					1230			
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1235						1240					1245			
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1295						1300					1305			
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 <213> Vicia villosa

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 <212> PRT  
 <213> Vicia villosa

<400> 18

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His	Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp
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Leu	Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met
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Pro	Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln
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Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile
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Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Leu	Val	Ala	Met	Val	Pro	Phe	Gly	Pro
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Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala
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Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp
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Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met
				165					170					175	
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu
			180					185					190		
Lys	Ile	Tyr	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys
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 Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu  
 260 265 270  
 Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe  
 275 280 285  
 Ser Ala Gly Ile Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala  
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 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val  
 305 310 315 320  
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln  
 325 330 335  
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His  
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 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile  
 355 360 365  
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp  
 370 375 380  
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
 385 390 395 400  
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu  
 405 410 415  
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
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 Gly Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
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<210> 19

<211> 1501

<212> DNA

<213> Lens culinaris

<400> 19

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<210> 20

<211> 499

<212> PRT

<213> Lens culinaris

<400> 20

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His	Pro	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	35	40	45	
Leu	Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	50	55	60	
Pro	Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	65	70	75	80
Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	85	90	95	
Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	100	105	110	
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	115	120	125	
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	130	135	140	
Phe	Leu	Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	145	150	155	160



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Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	
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Ile	Lys	Ile	Thr	Lys	Glu	Gln	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	
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Tyr	Ser	Val	Val	Gly	Lys	Asp	Ile	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	
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Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	
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Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	
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Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	
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Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Gly	Pro	Leu	
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Asp	Leu	Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	
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Arg	Met	Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	
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Leu	Ala	Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	
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Gly	Gln	Ile	Leu	Lys	Gly	Asp	Asp	Ala	Lys	Val	Ser	Met	Glu	Glu	Arg	
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Ala Arg Ile

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<211> 499  
<212> PRT  
<213> Lens culinaris

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His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp  
35 40 45  
Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met  
50 55 60  
Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln  
65 70 75 80

Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	
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Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	
			100					105					110			
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	
		115					120					125				
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	
		130				135					140					
Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	
145					150					155					160	
Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	
				165					170					175		
Val	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	
			180					185					190			
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	
		195					200					205				
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	
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Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	
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Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	
			260					265						270		
Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	
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Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	
	290					295					300					
Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	
305					310					315					320	
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	
				325					330					335		
Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	
			340					345					350			
Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	
		355					360						365			
Asn	Gly	Cys	Val	Thr	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp	
	370					375					380					
Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	
385					390					395					400	

Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu  
405 410 415

Asp Leu Arg Gly Arg His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
420 425 430

Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
435 440 445

Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
450 455 460

Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg  
465 470 475 480

Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
485 490 495

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<210> 23  
<211> 1566  
<212> DNA  
<213> Phaseolus aureus

<400> 23

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atcgacctct	ccaaaaaaca	tggtccctta	ttctctctct	actttggctc	catgccaaacc	240
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tctaaa						1566

<210> 24  
<211> 522  
<212> PRT  
<213> Phaseolus aureus

<400> 24

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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
35 40 45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser  
50 55 60

Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr  
65 70 75 80

Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His  
85 90 95

Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg  
100 105 110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp  
115 120 125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr  
130 135 140

Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu  
145 150 155 160

Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr  
165 170 175

Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu  
180 185 190

Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile  
195 200 205

Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu  
210 215 220

Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe  
225 230 235 240

Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg  
245 250 255

Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly Val Phe  
260 265 270

Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu Ile Lys  
275 280 285

Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala  
290 295 300

Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu  
305 310 315 320

Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Ala Tyr Ser  
 325 330 335  
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu  
 340 345 350  
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro  
 355 360 365  
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
 370 375 380  
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
 385 390 395 400  
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
 420 425 430  
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
 435 440 445  
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
 450 455 460  
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
 465 470 475 480  
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
 485 490 495  
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 <211> 1566  
 <212> DNA  
 <213> Phaseolus aureus

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 cgtcttccct tcataggaca ccttcatctc ttaaaagaca aacttctcca ctacgcgctc 180  
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<210> 26

<211> 521

<212> PRT

<213> Phaseolus aureus

<400> 26

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Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His	Leu	35	40	45	
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	Leu	Ser	50	55	60	
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	Pro	Thr	65	70	75	80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His	85	90	95	
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg	100	105	110	
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	115	120	125	
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	130	135	140	
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	145	150	155	160
Arg	Ala	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr	165	170	175	
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	180	185	190	
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	195	200	205	

Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu  
210 215 220  
Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe  
225 230 235 240  
Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg  
245 250 255  
Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly Val Phe  
260 265 270  
Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu Ile Lys  
275 280 285  
Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala  
290 295 300  
Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu  
305 310 315 320  
Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser  
325 330 335  
Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu  
340 345 350  
Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro  
355 360 365  
Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
370 375 380  
Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
385 390 395 400  
Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
405 410 415  
Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
420 425 430  
Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
435 440 445  
Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
450 455 460  
Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
465 470 475 480  
Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
485 490 495  
Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg  
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Ile Gly Val Ala Ser Lys Leu Leu Ser  
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<210> 27  
 <211> 1566  
 <212> DNA  
 <213> Phaseolus aureus

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 <211> 521  
 <212> PRT  
 <213> Phaseolus aureus

<400> 28  
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 Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
 35 40 45  
 His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser  
 50 55 60  
 Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr  
 65 70 75 80  
 Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His  
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 Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg  
 100 105 110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp  
 115 120 125  
 Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr  
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 Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu  
 145 150 155 160  
 Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr  
 165 170 175  
 Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu  
 180 185 190  
 Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile  
 195 200 205  
 Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu  
 210 215 220  
 Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe  
 225 230 235 240  
 Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg  
 245 250 255  
 Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly Val Phe  
 260 265 270  
 Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu Ile Lys  
 275 280 285  
 Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala  
 290 295 300  
 Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu  
 305 310 315 320  
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser  
 325 330 335  
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu  
 340 345 350  
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro  
 355 360 365  
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
 370 375 380  
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
 385 390 395 400  
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
 420 425 430

Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
435 440 445

Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
450 455 460

Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
465 470 475 480

Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
485 490 495

Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg  
500 505 510

Ile Gly Val Ala Ser Lys Leu Leu Ser  
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<211> 1566  
<212> DNA  
<213> Phaseolus aureus

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cgtcttccct tcataggaca ccttcatctc ttaaaagaca aacttctcca ctacgcactc 180  
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ttcaacacaa gggtccaaac ctccagccata agacgcctca cctatgatag ctccagtggcc 360  
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aacgccacca ctgtaaacaa gttgaggcct ttgaggaccc aacagatccg caagttcctt 480  
agggttatgg cccaaggcgc agaggcacag aagcccttg acttgaccga ggagcttctg 540  
aaatggacca acagcaccat ctccatgatg atgctcggcg aggctgagga gatcagagac 600  
atcgctcgcg aggttcttaa gatctttggc gaatacagcc tccactgactt catctggcca 660  
ttgaagcatc tcaaggttgg aaagtatgag aagaggatcg acgacatctt gaacaagttc 720  
gacctgtctg ttgaaagagt catcaagaag cgccgtgaga tcgtgaggag gagaaagaac 780  
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gaggatgaga ccatggagat caaaatcacc aaggaccaca tcaagggctt tgttgctcgac 900  
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gacagacttg tggacgaagt tgacactcaa aaccttctt acattagagc aatcgtgaag 1080  
gagacattcc gcatgcaccc gccactccca gtggtcaaaa gaaagtgcac agaagagtgt 1140  
gagattaatg gatattgtgat cccagagggg gcattgattc tcttcaatgt atggcaagta 1200  
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ccatttgggt ctgggaggag aatgtgccct ggagtcaatc tggctacttc gggaatggca 1380  
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atattgaagg gtggtgacgc caaagttagc atggaagaga gagccggcct cactgttcca 1500  
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tcttaa 1566

<210> 30  
<211> 521  
<212> PRT  
<213> Phaseolus aureus

<400> 30

Met Leu Leu Glu Leu Ala Leu Gly Leu Leu Val Leu Ala Leu Phe Leu  
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His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu  
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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
35 40 45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser  
50 55 60

Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr  
65 70 75 80

Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His  
85 90 95

Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg  
100 105 110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp  
115 120 125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr  
130 135 140

Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu  
145 150 155 160

Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr  
165 170 175

Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu  
180 185 190

Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile  
195 200 205

Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu  
210 215 220

Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe  
225 230 235 240

Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg  
245 250 255

Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly Val Phe  
260 265 270

Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu Ile Lys  
275 280 285

Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala  
290 295 300

Gly Thr Asp Ser Thr Ala Glu Ala Thr Glu Trp Ala Leu Ala Glu Leu  
305 310 315 320

Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser  
 325 330 335  
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu  
 340 345 350  
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro  
 355 360 365  
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
 370 375 380  
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
 385 390 395 400  
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
 420 425 430  
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
 435 440 445  
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
 450 455 460  
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
 465 470 475 480  
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
 485 490 495  
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg  
 500 505 510  
 Ile Gly Val Ala Ser Lys Leu Leu Ser  
 515 520

<210> 31  
 <211> 1566  
 <212> DNA  
 <213> *Trifolium pratense*

<400> 31  
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 acaccactg caaaatcaaa agcacttgcg catctcccaa accaccaag cccaaagcct 120  
 cgtcttcct tcataggaca ccttcatctc ttaaaagaca aacttctcca ctacgcactc 180  
 atcgacctct ccaaaaaaca tggtcacctta ttctctctct actttggctc catgccaaacc 240  
 gttgttgctt ccacaccaga attgttcaag ctcttctctc aaacgcacga ggcaacttcc 300  
 ttcaacacaa ggttccaaac ctccagccata agacgcctca cctatgatag ctcaagtggcc 360  
 atggttccca tcggacctta ctggaagttc gtgaggaagc tcatcatgaa cgaccttctc 420  
 aacgccacca ctgtaaacaa gttgaggcct ttgaggaccc aacagatccg caagttcctt 480  
 agggttatgg cccaaggcgc agaggcacag aagccccttg acttgaccga ggagcttctg 540  
 aaatggacca acagcaccat ctccatgatg atgctcggcg aggctgagga gatcagagac 600  
 atcgctcgcg aggttcttaa gatctttggc gaatacagcc tcaactgactt catctggcca 660  
 ttgaagcatc tcaaggttgg aaagtatgag aagaggatcg acgacatctt gaacaagttc 720  
 gaccctgtcg ttgaaagagt catcaagaag cgccgtgaga tcgtgaggag gagaaagaac 780  
 ggagagggtg atgagggtga ggtcagcggg gttttccttg acactttgct tgaattcgct 840

gaggatgaga	ccacggagat	caaaatcacc	aaggaccaca	tcaaggggtct	tggtgtcgac	900
tttttctcgg	cagggacaga	ctccacagcg	gtggcaacag	agtgggcatt	ggcagaactc	960
atcaacaatc	ctaaggtggt	ggaaaaggct	cgtgaggagg	tctacagtgt	tggtgggaaag	1020
gacagacttg	tggaaggaag	tgacactcaa	aaccttcctt	acattagagc	aatcgtgaag	1080
gagacattcc	gcatgcaccc	gccactccca	gtggtcaaaa	gaaagtgcac	agaagagtgt	1140
gagattaatg	gatatgtgat	cccagagggg	gcattgattc	tcttcaatgt	atggcaagta	1200
ggaagagacc	ccaaatactg	ggacagacca	tcggagttcc	gtcctgagag	gttcctagag	1260
acaggggctg	aaggggaagc	aaggcctctt	gatcttaggg	gacaacattt	tcaacttctc	1320
ccatttgggg	ctgggaggag	aatgtgccct	ggagtcaatc	tggtacttc	gggaatggca	1380
acacttcttg	catctcttat	tcagtgtctt	gacttgcaag	tgctgggtcc	acaaggacag	1440
atattgaagg	gtggtgacgc	caaagttagc	atggaagaga	gggccggcct	cactgttcca	1500
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tcttaa						1566

<210> 32

<211> 521

<212> PRT

<213> *Trifolium pratense*

<400> 32

Met	Leu	Leu	Glu	Leu	Ala	Leu	Gly	Leu	Leu	Val	Leu	Ala	Leu	Phe	Leu	1	5	10	15
His	Leu	Arg	Pro	Thr	Pro	Thr	Ala	Lys	Ser	Lys	Ala	Leu	Arg	His	Leu	20	25	30	
Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His	Leu	35	40	45	
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	Leu	Ser	50	55	60	
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	Pro	Thr	65	70	75	80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His	85	90	95	
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg	100	105	110	
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Ile	Gly	Pro	Tyr	Trp	115	120	125	
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	130	135	140	
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	145	150	155	160
Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr	165	170	175	
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	180	185	190	
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	195	200	205	

Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu		
210						215					220						
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe		
225					230					235					240		
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg		
				245					250					255			
Arg	Arg	Lys	Asn	Gly	Glu	Val	Asp	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe		
			260					265					270				
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Thr	Glu	Ile	Lys		
		275					280					285					
Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala		
	290					295					300						
Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu		
305					310					315					320		
Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	Tyr	Ser		
				325					330					335			
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu		
			340					345					350				
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro		
		355					360					365					
Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	Gly		
	370					375					380						
Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp	Gln	Val		
385					390					395				400			
Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	Pro	Glu		
				405					410					415			
Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	Asp	Leu		
			420					425					430				
Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	Arg	Met		
	435						440					445					
Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	Leu	Ala		
	450					455					460						
Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	Gly	Gln		
465					470					475					480		
Ile	Leu	Lys	Gly	Gly	Asp	Ala	Lys	Val	Ser	Met	Glu	Glu	Arg	Ala	Gly		
			485						490					495			
Leu	Thr	Val	Pro	Arg	Ala	His	Ser	Leu	Val	Cys	Val	Pro	Leu	Ala	Arg		
			500					505					510				
Ile	Gly	Val	Ala	Ser	Lys	Leu	Leu	Ser									
	515					520											

<210> 33  
 <211> 1566  
 <212> DNA  
 <213> Trifolium pratense

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 cgtcttccct tcataggaca ccttcacatc ttaaaagaca aacttctcca ctacgcactc 180  
 atcgacctct ccaaaaaaca tggtcctta ttctctctct actttggctc catgccaacc 240  
 gttgttgctt ccacaccaga attgttcaag ctcttctctc aaacgcacga ggcaacttcc 300  
 ttcaacacaa ggttccaaac ctacagccata agacgcctca cctatgatag ctcatgtggc 360  
 atggttccct tcggacctta ctggaagttc gtgaggaagc tcatcatgaa cgaccttctc 420  
 aacgccacca ctgtaaaca gttgaggcct ttgaggaccc aacagatccg caagttcctt 480  
 agggttatgg cccaaggcgc agaggcacag aagccccttg acttgaccga ggagcttctg 540  
 aaatggacca acagcaccat ctccatgatg atgctcggcg aggctgagga gatcagagac 600  
 atcgctcgcg aggttcttaa gatctttggc gaatacagcc tcatgactt catctggcca 660  
 ttgaagcatc tcaaggttgg aaagtatgag aagaggatcg acgacatctt gaacaagttc 720  
 gacctgtcgt ttgaaagagt catcaagaag cgccgtgaga tcgtgaggag gagaaagaac 780  
 ggagagggtt ttgagggtga ggtcagcggg gttttccttg acactttgct tgaattcgct 840  
 gaggatgaga ccacggagat caaaatcacc aaggaccaca tcaagggtct tgttgtcgac 900  
 tttttctcgg caggaacaga ctccacagcg gtggcaacag agtgggcatt ggcagaactc 960  
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 gagattaatg gatatgtgat cccagagggg gcattgattc tcttcaatgt atggcaagta 1200  
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 agggcacata gtcttgtctg tgttccactt gcaaggatcg gcgttgcatc taaactcctt 1560  
 tcttaa 1566

<210> 34  
 <211> 521  
 <212> PRT  
 <213> Trifolium pratense

<400> 34  
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 His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu  
 20 25 30  
 Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
 35 40 45  
 His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser  
 50 55 60  
 Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr  
 65 70 75 80  
 Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His  
 85 90 95  
 Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg  
 100 105 110



Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp  
 115 120 125  
 Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr  
 130 135 140  
 Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu  
 145 150 155 160  
 Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr  
 165 170 175  
 Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu  
 180 185 190  
 Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile  
 195 200 205  
 Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu  
 210 215 220  
 Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe  
 225 230 235 240  
 Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg  
 245 250 255  
 Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly Val Phe  
 260 265 270  
 Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu Ile Lys  
 275 280 285  
 Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala  
 290 295 300  
 Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu  
 305 310 315 320  
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser  
 325 330 335  
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu  
 340 345 350  
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro  
 355 360 365  
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
 370 375 380  
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
 385 390 395 400  
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
 420 425 430

Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
 435 440 445  
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
 450 455 460  
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
 465 470 475 480  
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
 485 490 495  
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg  
 500 505 510  
 Ile Gly Val Ala Ser Lys Leu Leu Ser  
 515 520

<210> 35  
 <211> 1563  
 <212> DNA  
 <213> Pisum sativum

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 cgtcttccct tcattggcca ccttcacctc ttaaaagata aacttctcca ctatgcactc 180  
 atcgatctct ccaaaaagca tggcccccta ttctctctct ccttcggctc catgccaaac 240  
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 aaatggacca acagcaccat ctccatgatg atgctcggcg aggctgagga gatcagagac 600  
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 ttgaagtatc tcaaggttgg aaagtatgag aagaggattg atgacatctt gaacaagttc 720  
 gacctgtctg ttgaaagggc catcaagaag cgccgtgaga tcgtcagaag gagaaagaac 780  
 ggagaagttg ttgagggcga ggccagcggc gtcttctctg acactttgct tgaattcgct 840  
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 tttttctctg cagggacaga ttccacagcg gtggcaacag agtgggcatt ggcagagctc 960  
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 gagacattcc gaatgcaccc accactccca gtggtcaaaa gaaagtgcac agaagagtgt 1140  
 gagattaatg ggtatgtgat cccagagggg gcattggttc ttttcaatgt ttggcaagta 1200  
 ggaaaggacc ccaaatactg ggacagacca tcagaattcc gtcccagagag gttcttagaa 1260  
 actggcgctg aaggggaagc agggcctctt gatcttaggg gccagcattt ccaactcctc 1320  
 ccatttgggt ctgggaggag aatgtgccct ggtgtcaatt tggctacttc aggaatggca 1380  
 acacttcttg catctcttat ccaatgcttt gacctgcaag tgctgggccc tcaaggacaa 1440  
 atattgaaag gtgacgatgc caaagttagc atggaagaga gagctggcct caccgttcca 1500  
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 tct 1563

<210> 36  
 <211> 521  
 <212> PRT  
 <213> Pisum sativum

<400> 36  
Met Leu Leu Glu Leu Ala Leu Gly Leu Phe Val Leu Ala Leu Phe Leu  
1 5 10 15  
His Leu Arg Pro Thr Pro Ser Ala Lys Ser Lys Ala Leu Arg His Leu  
20 25 30  
Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
35 40 45  
His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser  
50 55 60  
Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met Pro Thr  
65 70 75 80  
Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Ala His  
85 90 95  
Glu Ala Thr Ser Phe Ser Thr Arg Phe Gln Thr Ser Ala Val Arg Arg  
100 105 110  
Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp  
115 120 125  
Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr  
130 135 140  
Val Asn Glu Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu  
145 150 155 160  
Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp Val Thr  
165 170 175  
Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu  
180 185 190  
Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile  
195 200 205  
Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys Tyr Leu  
210 215 220  
Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe  
225 230 235 240  
Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg  
245 250 255  
Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Ala Ser Gly Val Phe  
260 265 270  
Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu Ile Lys  
275 280 285  
Ile Thr Lys Glu Gln Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala  
290 295 300  
Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu  
305 310 315 320

Ile Asn Asn Pro Arg Val Leu Gln Lys Ala Arg Glu Glu Val Tyr Ser  
 325 330 335  
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu  
 340 345 350  
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro  
 355 360 365  
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
 370 375 380  
 Tyr Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp Gln Val  
 385 390 395 400  
 Gly Lys Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu Asp Leu  
 420 425 430  
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
 435 440 445  
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
 450 455 460  
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
 465 470 475 480  
 Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
 485 490 495  
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg  
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 Ile Gly Val Ala Ser Lys Leu Leu Ser  
 515 520

<210> 37

<211> 1496

<212> DNA

<213> *Trifolium repens*

<400> 37

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ccaagcccaa	ggcctcgtct	tcccttcatt	ggccaccttc	acctcttaaa	agataaactt	120
ctccactatg	cacccatcga	tctctccaaa	aagcatggcc	ccttattctc	tctctccttc	180
ggctccatgc	caaccgtcgt	tgccctccacc	cctgagttgt	tcaagctctt	cctccaaaacc	240
cacgaggcaa	cttccttcaa	cacaagggtc	caaaccctctg	ccataagaca	cctcacttac	300
gacaactctg	tggccatggt	tccattcgga	ccttactgga	agttcgtgag	gaagctcatc	360
atgaacgacc	ttctcaacgc	caccacgcgc	aacaagctca	ggcctttgag	gacccaacag	420
atccgcaagt	tccttagggg	tatggcccaa	agcgagagg	cccagaagcc	ccttgacgtc	480
accgaggagc	ttctcaaata	gaccaacagc	accatctcca	tgatgatgct	cggcgaggct	540
gaggagatca	gagacatcgc	tcgcgaggtt	cttaagatct	tcggcgaata	cagcctcact	600
gacttcatct	ggcctttgaa	gtacctcaag	gttggaaggt	atgagaagag	gattgatgac	660
atcttgaaca	agttcgaccc	tgctgttgaa	agggtcatca	agaagcgccg	tgagatcgtc	720
agaaggagaa	agaacggaga	agttgttgag	ggcgaggcca	gcggcgctctt	cctcgacact	780
ttgcttgaat	tcgctgagga	cgagaccatg	gagatcaaaa	ttaccaagga	gcaaatcaag	840

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ggccttggtg tgcacttttt ctctgcaggg acagattcca cagcgggtggt aacagagtgg      900
gcattggcag agctcatcaa caatcccagg gtgttgcaaa aggctcgtga ggaggtctac      960
agtgttggtg gcaaagatag actcgttgac gaagttgaca ctcaaaacct tccttacatt    1020
agggccattg tgaaggagac attccgaatg caccaccac tcccagtggt caaaagaaaag    1080
tgcacagaag agtgtgagat taatgggtat gtgatcccag agggagcatt ggttcttttc    1140
aatgtttggc aagtaggaag ggaccccaaa tactgggaca gaccatcaga atcccgcccc    1200
gagaggttct tagaaactgg tgctgaaggg gaagcagggc ctcttgatct taggggccag    1260
catttccaac tcctcccatt tgggtctggg aggagaatgt gccctgggtg cagtttggtg    1320
acttcaggaa tggcaacact tcttgcatct cttatccaat gctttgacct gcaagtgctg    1380
ggcctcaag gacaaatatt gaaagggtgat gatgccaaag ttagcatgga agagagagct    1440
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<210> 38
<211> 498
<212> PRT
<213> Trifolium repens

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<400> 38
Ser His Leu Arg Pro Thr Pro Ser Ala Ile Ser Lys Ala Leu Arg His
1              5              10              15

Leu Pro Asn Pro Pro Ser Pro Arg Pro Arg Leu Pro Phe Ile Gly His
                20              25              30

Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Pro Ile Asp Leu
                35              40              45

Ser Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met Pro
50              55              60

Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr
65              70              75              80

His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg
                85              90              95

His Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro Tyr
                100             105             110

Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr
                115             120             125

Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe
130             135             140

Leu Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp Val
145             150             155             160

Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met
                165             170             175

Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys
                180             185             190

Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys Tyr
                195             200             205

Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys
210             215             220

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Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val  
225 230 235 240  
Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Ala Ser Gly Val  
245 250 255  
Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu Ile  
260 265 270  
Lys Ile Thr Lys Glu Gln Ile Lys Gly Leu Val Val Asp Phe Phe Ser  
275 280 285  
Ala Gly Thr Asp Ser Thr Ala Val Val Thr Glu Trp Ala Leu Ala Glu  
290 295 300  
Leu Ile Asn Asn Pro Arg Val Leu Gln Lys Ala Arg Glu Glu Val Tyr  
305 310 315 320  
Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn  
325 330 335  
Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro  
340 345 350  
Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn  
355 360 365  
Gly Tyr Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp Gln  
370 375 380  
Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Ser Arg Pro  
385 390 395 400  
Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu Asp  
405 410 415  
Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg  
420 425 430  
Met Cys Pro Gly Val Ser Leu Ala Thr Ser Gly Met Ala Thr Leu Leu  
435 440 445  
Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly  
450 455 460  
Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg Ala  
465 470 475 480  
Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala  
485 490 495

Arg Ile

<210> 39  
<211> 1501  
<212> DNA  
<213> Trifolium repens

<400> 39

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acccaccaag	cccaaagcct	cgtcttcctt	tcataggaca	ccttcattct	ttaaaagaca	120
aactttctcca	ctacgcactc	atcgacctct	ccaaaaaaca	tggtccctta	ttctctctct	180
actttggctc	catgccaacc	gttggtgcct	ccacaccaga	attgttcaag	ctcttcctcc	240
aaacgcacga	ggcaacttcc	ttcaacacaa	ggttcctaac	ctcagccata	agacgcctca	300
cctacgacaa	ctctgtggcc	atgggtccat	tcggacctta	ctggaagttc	gtgaggaagc	360
tcatcatgaa	cgaccttctc	aacgccacca	ccgtcaacaa	gctcaggcct	ttgaggaccc	420
aacagatccg	caagttcctt	aggggttatg	cccaaagcgc	agaggcccag	aagccccttg	480
acgtcaccga	ggagcttctc	aaatggacca	acagcaccat	ctccatgatg	atgctcggcg	540
aggctgagga	gatcagagac	atcgctcgcg	aggttcttaa	gatcttcggc	gaatacagcc	600
tactgactt	catctggcct	ttgaagtatc	tcaagggttg	aaagtatgag	aagaggattg	660
atgacatctt	gaacaagttc	gacctgtctg	ttgaaagagt	catcaagaag	cgccgtgaga	720
tcgtcagaag	gagaaagaac	ggagaagttg	ttgagggcga	ggccagcggc	gtcttcctcg	780
acactttgct	tgaattcgct	gaggacgaga	ccatggagat	caaaattacc	aaggagcaaa	840
tcaagggcct	tgttgtcgac	tttttctctg	cagggacaga	ttccacagcg	gtggcaacag	900
agtgggcatt	ggcagagctc	atcaacaatc	ccaagggtgt	gcaaaaggct	cgtgaggagg	960
cctacagtgt	tgtgggcaaa	gatagactcg	ttgacgaagt	tgacactcaa	aaccttcctt	1020
acattagggc	cattgtgaag	gagacattcc	gaatgcaccc	accactccca	gtgggtcaaaa	1080
gaaagtgcac	agaagagtgt	gggattaatg	ggtatgtgat	cccagagggg	gcattgggttc	1140
ttttcaatgt	ttggcaagta	ggaagggacc	ccaaatactg	ggacagacca	tcagaattcc	1200
gtcccagagag	gttcttagaa	actggtgctg	aaggggaagc	agggcctctt	gatcttaggg	1260
gccagcattt	ccaactcctc	ccatttggtt	ctgggaggag	aatgtgccct	ggtgtcaatt	1320
tggtacttct	aggaatggca	acacttcttg	catctcttat	ccaatgcttt	gacctgcaag	1380
tgctgggccc	tcaaggacaa	atattgaaag	gtgatgatgc	caaagttagc	atggaagaga	1440
gagctggcct	cacagttcca	agggcacata	gtctcgtttg	tgttccactt	gcaaggatcg	1500
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<210> 40

<211> 499

<212> PRT

<213> *Trifolium repens*

<400> 40

Phe	Leu	His	Leu	Arg	Pro	Thr	Pro	Thr	Ala	Lys	Ser	Lys	Ala	Leu	Arg
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His	Leu	Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly
			20					25					30		
His	Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp
		35					40					45			
Leu	Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met
	50					55					60				
Pro	Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln
65					70					75					80
Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile
			85					90						95	
Arg	Arg	Leu	Thr	Tyr	Asp	Asn	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro
			100					105					110		
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala
		115					120					125			
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys
		130				135					140				

Phe	Leu	Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	
145					150					155					160	
Val	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	
				165					170					175		
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	
			180					185					190			
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	
		195					200					205				
Tyr	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	
	210					215					220					
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	
225					230					235					240	
Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Ala	Ser	Gly	
				245					250					255		
Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	
			260					265					270			
Ile	Lys	Ile	Thr	Lys	Glu	Gln	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	
		275					280					285				
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	
	290					295					300					
Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Gln	Lys	Ala	Arg	Glu	Glu	Ala	
305					310					315					320	
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	
				325					330					335		
Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	
			340					345					350			
Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Gly	Ile	
		355					360					365				
Asn	Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Val	Leu	Phe	Asn	Val	Trp	
	370					375					380					
Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	
385					390					395					400	
Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Gly	Pro	Leu	
				405					410					415		
Asp	Leu	Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	
			420					425					430			
Arg	Met	Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	
		435					440					445				
Leu	Ala	Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	
	450					455					460					



Gly Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg  
 465 470 475 480

Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
 485 490 495

Ala Arg Ile

<210> 41  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 41  
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<210> 42  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 42  
 gtatatgatg ggtaccttaa ttaagaaagg ag 32

<210> 43  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 43  
 gacgcctcac ttacgacaac tctgtg 26

<210> 44  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 44  
 cctctcggga cggaattctg atggt 25

<210> 45  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 45  
gcggtgcacg ggcggactct tcttc 25

<210> 46  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 46  
cgccaatac gcaaaccgcc tctcc 25

<210> 47  
<211> 1501  
<212> DNA  
<213> Beta vulgaris

<400> 47  
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acccaccaag cccaaagcct cgtcttccct tcataggaca ccttcattctc ttaaaagaca 120  
aacttctcca ctacgcactc atcgacctct ccaaaaaaca tggctccctta ttctctctct 180  
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aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctccagccata agacgcctca 300  
cctatgatag ctccagtggcc atggttccct tcggacctta ctggaagttc gtgaggaagc 360  
tcatcatgaa cgaccttctc aacgccacca ctgtaaaciaa gttgaggcct ttgaggaccc 420  
aacagatccg caagttcctt aggggttatgg cccaaggcgc agaggcacag aagccccttg 480  
acttgaccga ggagcttctg aaatggacca acagcaccat ctccatgatg atgctcggcg 540  
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tactgactt catctggcca ttgaagcatc tcaaggttg aaagtatgag aagaggatcg 660  
acgacatctt gaacaagttc gacctgtctg ttgaaagagt catcaagaag cgccgtgaga 720  
tcgtgaggag gagaaagaac ggagaggatg ttgaggggtga ggtcagcggg gttttccttg 780  
acactttgct tgaattcgct gaggatgaga ccatggagat caaaatcacc aaggaccaca 840  
tcaagggctc tgttgctgac tttttctcgg caggaacaga ctccacagcg gtggcaacag 900  
agtgggcatt ggcagaactc atcaacaatc ctaaggtgtt ggaaaaggct cgtgaggagg 960  
tctacagtgt tgtgggaaag gacagacttg tggacgaagt agacactcaa aaccttctt 1020  
acattagagc aatcgtgaag gagacattcc gcatgcaccc gccactcca gtggtcaaaa 1080  
gaaagtgcac agaagagtgt gagattaatg gatatgtgat cccagaggga gcattgattc 1140  
tcttcaatgt atggcaagta ggaagagacc ctaaatactg ggacagacca tcggagttcc 1200  
gtcctgagag gttcctagag acaggggctg aaggggaagc aaggcttctt gatcttaggg 1260  
gacaacattt tcaacttctc ccatttgggt ctgggaggag aatgtgccct ggagtcaatc 1320  
tggctacttc gggaatggca acacttcttg catctcttat tcagtgtttt gacttgcaag 1380  
tgctgggtcc acaaggacag atattgaagg gtggtgacgc caaagttagc atggaagaga 1440  
gagccggcct cactgttcca agggcacata gtcttgtctg tgttccactt gcaaggatcg 1500  
g 1501

<210> 48  
<211> 499  
<212> PRT  
<213> Beta vulgaris

<400> 48  
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His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly  
20 25 30

His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp  
 35 40 45  
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met  
 50 55 60  
 Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln  
 65 70 75 80  
 Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile  
 85 90 95  
 Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro  
 100 105 110  
 Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala  
 115 120 125  
 Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys  
 130 135 140  
 Phe Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp  
 145 150 155 160  
 Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met  
 165 170 175  
 Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu  
 180 185 190  
 Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys  
 195 200 205  
 His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn  
 210 215 220  
 Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile  
 225 230 235 240  
 Val Arg Arg Arg Lys Asn Gly Glu Asp Val Glu Gly Glu Val Ser Gly  
 245 250 255  
 Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu  
 260 265 270  
 Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe  
 275 280 285  
 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala  
 290 295 300  
 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val  
 305 310 315 320  
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln  
 325 330 335  
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His  
 340 345 350

Pro Pro Leu Pro Val Val Lys Arg Lys Cys Ile Glu Glu Cys Glu Ile  
           355                          360                          365  
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp  
       370                          375                          380  
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
 385                          390                          395                          400  
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Leu Leu  
                           405                          410                          415  
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
                           420                          425                          430  
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
           435                          440                          445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
       450                          455                          460  
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg  
 465                          470                          475                          480  
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
                           485                          490                          495

Ala Arg Ile

<210> 49  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 49  
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30

<210> 50  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 50  
 gaattcgcg cgcgaattg ggtaccgggc

30

<210> 51  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 51  
gcaaacgaag acaaattggga gatgata

27

<210> 52  
<211> 1801  
<212> DNA  
<213> Glycine max

<220>  
<221> Intron  
<222> (895) .. (1112)

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cttcccttca ttggccacct tcacctctta aaagataaac ttctccacta tgcactcatc 180  
gatctctcca aaaagcatgg ccccttattc tctctctcct tcggctccat gccaacgctc 240  
gttgccctcca cccctgagtt gttcaagctc ttctctccaa cccacgaggc aacttccttc 300  
aacacaaggt tccaaacctc tgccataaga cgcctcactt acgacaactc tgtggccatg 360  
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c 1801

<210> 53  
<211> 1900  
<212> DNA  
<213> Glycine max

<220>  
<221> Intron  
<222> (947) .. (1082)

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cataggacac cttcatctct taaaagacaa acttctccac tacgcaactc tcgacctctc 240  
caaaaaacat ggtcccttat tctctctcta ctttgggtcc atgccaaccg ttgttgcttc 300

cacaccagaa	ttgttcaagc	tcttcctcca	aacgcacgag	gcaacttctt	tcaacacaag	360
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cggaccttac	tggaagtctg	tgaggaaagc	catcatgaac	gaccttccca	acgccaccac	480
tgtaaacaag	ttgaggcctt	tgaggaccca	acagaccgcg	aagtctctta	gggttatggc	540
ccaaggcgca	gaggcacaga	agccccctga	cttgaccgag	gagcttctga	aatggacca	600
cagcaccatc	tccatgatga	tgctcggcga	ggctgaggag	atcagagaca	tcgctcgcg	660
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tcctttctta	attaagatca	tcgtcatcat	catcatatat	aatattttact	ttttgtgtgt	1800
tgataatcat	catttcaata	aggctctcgt	catctacttt	ttatgaagta	tataagccct	1860
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<210> 54

<211> 1501

<212> DNA

<213> Lupinus albus

<400> 54

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tcatcatgaa	cgaccttctt	aacgccacca	ctgtaaacaa	gttgaggcct	ttgaggacct	420
aacagatccg	caagttcctt	agggttatgg	cccaaggcgc	agaggcacag	aagccccttg	480
acttgaccga	ggagcttctg	aaatggacca	acagcaccat	ctccatgatg	atgctcggcg	540
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tactgacttt	catctggcca	ttgaagcatc	tcaagggttg	aaagtatgag	aagaggatcg	660
acgacatctt	gaacaagtgc	gaccctgtcg	ttgaaagagt	catcaagaag	cgccgtgaga	720
tcgtgaggag	gagaaagaac	ggagagggtg	ttgagggtga	ggtcagcggg	gttctccttg	780
acactttgct	tgaattcgct	gaggatgaga	ccatggagat	caaaatcacc	aaggaccaca	840
tcaagggtct	tggtgtcgac	tttttctcgg	caggaacaga	ctccacagcg	gtggcaacag	900
agtgggcatt	ggcagaactc	atcaacaatc	ctaagggtgt	ggaaagggtc	cgtgaggagg	960
tctacagtgt	tgtgggaaag	gacagacttg	tggacgaagt	tgacactcaa	aaccttccct	1020
acattagagc	aatcgtgaag	gagacattcc	gcatgcacc	gccactccca	gtgggtcaaaa	1080
gaaagtgcac	agaagagtgt	gagattaatg	gatatgtgat	cccagaggga	gcattgattc	1140
tcttcaatgt	atggcaagta	ggaagagacc	ggaactactg	ggacagacca	ctggaggtcc	1200
gtcctgagag	gttcctagag	acagaggctg	aaggggaagc	aaggcctctt	gatcttaggg	1260
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tgctgggtcc	acaaggacag	atattgaagg	gtggtgacgc	caaagttagc	atggaagaga	1440
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g						1501

<210> 55  
 <211> 499  
 <212> PRT  
 <213> Lupinus albus

<400> 55  
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 His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly  
 20 25 30  
 His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp  
 35 40 45  
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met  
 50 55 60  
 Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln  
 65 70 75 80  
 Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile  
 85 90 95  
 Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Arg Val Pro Phe Gly Pro  
 100 105 110  
 Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala  
 115 120 125  
 Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys  
 130 135 140  
 Phe Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp  
 145 150 155 160  
 Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met  
 165 170 175  
 Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu  
 180 185 190  
 Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys  
 195 200 205  
 His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn  
 210 215 220  
 Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile  
 225 230 235 240  
 Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly  
 245 250 255  
 Val Leu Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu  
 260 265 270  
 Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe  
 275 280 285

Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala  
 290 295 300  
 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Arg Ala Arg Glu Glu Val  
 305 310 315 320  
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln  
 325 330 335  
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His  
 340 345 350  
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile  
 355 360 365  
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp  
 370 375 380  
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
 385 390 395 400  
 Pro Glu Arg Phe Leu Glu Thr Glu Ala Glu Gly Glu Ala Arg Pro Leu  
 405 410 415  
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
 420 425 430  
 Arg Met Cys Pro Gly Val Ile Leu Ala Thr Ser Gly Met Ala Thr Leu  
 435 440 445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
 450 455 460  
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg  
 465 470 475 480  
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
 485 490 495

Ala Arg Ile

<210> 56  
 <211> 1501  
 <212> DNA  
 <213> Medicago sativa

<400> 56  
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 aacttctcca ctacgcactc atcgacctct ccaaaaaaca tggtcctta ttctctctct 180  
 actttggctc catgccaacc gttgttgccct ccacaccaga attgttcaag ctcttccttc 240  
 aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctgagccata agacgcctca 300  
 cctatgatag ctacgtggcc atggctccct tcggacctta ctggaagttc gtgaggaagc 360  
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 aacagatccg caagttcctt aggggttatgg cccaaggcgc agaggcacag aagccccttg 480  
 acttgaccga ggagcttctg aaatggacca acagcaccac ctccatgatg atgctcggcg 540  
 aggctgagga gatcagagac atcgcccgcg aggttcttaa gatctttggc gaatacagcc 600  
 tcaactgactt catccggcca ttgaagcatc tcaaggttgg aaagtatgag aagaggatcg 660



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acactttgct	tgaattcgct	gaggatgaga	ccacggagat	caaaatcacc	aaggaccaca	840
tcaagggctt	tgttgtcgac	tttttctcgg	caggaacaga	ctccacagcg	gtggcaacag	900
agtgggcatt	ggcagaactc	atcaacaatc	ctaagggtgt	ggaaaagggt	cgtgaggagg	960
tctacagtgt	tgtgggaaag	gacagacttg	tggacgaagt	tgacactcaa	aaccttcctt	1020
acattagagc	aatcgtgaag	gagacattcc	gcatgcaccc	gccactccca	gtggtcaaaa	1080
gaaagtgcac	agaagagtgt	gagattaatg	gatatgtgat	cccagaggga	gcattgattc	1140
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tgctgggtcc	acaaggacag	atattgaagg	gtggtgacgc	caaagttagc	atggaagaga	1440
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g						1501

<210> 57  
 <211> 499  
 <212> PRT  
 <213> Medicago sativa

<400> 57  
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 His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp  
 35 40 45  
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met  
 50 55 60  
 Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln  
 65 70 75 80  
 Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile  
 85 90 95  
 Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Ala Pro Phe Gly Pro  
 100 105 110  
 Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala  
 115 120 125  
 Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys  
 130 135 140  
 Phe Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp  
 145 150 155 160  
 Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Thr Ser Met Met  
 165 170 175  
 Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu  
 180 185 190  
 Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Arg Pro Leu Lys  
 195 200 205

His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn  
 210 215 220  
 Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile  
 225 230 235 240  
 Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly  
 245 250 255  
 Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu  
 260 265 270  
 Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe  
 275 280 285  
 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala  
 290 295 300  
 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val  
 305 310 315 320  
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln  
 325 330 335  
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His  
 340 345 350  
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile  
 355 360 365  
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp  
 370 375 380  
 Gln Val Gly Arg Asp Ser Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
 385 390 395 400  
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu  
 405 410 415  
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
 420 425 430  
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
 435 440 445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
 450 455 460  
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg  
 465 470 475 480  
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
 485 490 495  
 Ala Arg Ile

<210> 58  
 <211> 1501

<212> DNA  
<213> Medicago sativa

<400> 58  
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actttggctc catgccaacc gttgttgctt ccacaccaga attgttcaag ctcttcctcc 240  
aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctcagccata agacgcctca 300  
cctatgatag ctcagtggcc atggttccct tcggacctta ctggaagttc gtgaggaagc 360  
tcatcatgaa cgaccttctc aacgccacca ctgtaaacia gttgaggcct ttgaggaccc 420  
aacagatccg caagctcctt aggggttatg cccaaggcgc agaggcacag aagccccttg 480  
acttgaccga ggagcttctg aaatggacca acagcaccat ctccatgatg atgctcggcg 540  
aggctgagga gatcagagac atcgctcgcg aggttcttaa gatctttggc gaatacagcc 600  
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acgacatctt gaacaagttc gaccctgtcg ttgaaagagt catcaagaag cgccgtgaga 720  
tcgtgaggag gagaaagaac ggagagggtta ttgagggtga ggtcagcggg gttttccttg 780  
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tcaaggggtc tgttgctgac tttttctcgg caggaacaga ctccacagcg gtggcaacag 900  
agtgggcatt ggcagaactc atcaacaatc ctaagggtgt ggagaaggct cgtgaggagg 960  
tctacagtgt tgtgggaaag gacagacttg tggacgaagt tgacactcaa aaccttctct 1020  
acattagagc aatcgtgaag gagacattcc gcatgcaccc gccactccca gtggtcaaaa 1080  
gaaagtgcac agaagagtgt gagattaatg gatatgtgat cccagaggga gcattgattc 1140  
tcttcaatgt atggcaagta ggaagagacc ccaaatactg ggacagacca tcggagttcc 1200  
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tggctacttc gggaaatggca acacttcttg catctcttat tcagtgtttt gacttgcaag 1380  
tgctgggtcc acaaggacag atattgaagg gtggtgacgc caaagttagc atggaagaga 1440  
gggccggcct cactgttcca agggcacata gtcttgtctg tgttcactt gcaaggatcg 1500  
g 1501

<210> 59  
<211> 499  
<212> PRT  
<213> Medicago sativa

<400> 59  
Phe Leu His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg  
1 5 10 15  
His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly  
20 25 30  
His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp  
35 40 45  
Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met  
50 55 60  
Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln  
65 70 75 80  
Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile  
85 90 95  
Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro  
100 105 110  
Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala  
115 120 125

Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	
	130					135					140					
Leu	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	
145					150				155						160	
Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	
				165					170					175		
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	
			180					185					190			
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	
		195					200					205				
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	
	210					215					220					
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	
225					230					235					240	
Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Ile	Glu	Gly	Glu	Val	Ser	Gly	
				245					250					255		
Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Thr	Glu	
			260					265					270			
Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	
		275					280					285				
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	
	290					295					300					
Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	
305					310					315					320	
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	
				325					330					335		
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Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	
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Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	
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Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	
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Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
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Ala Arg Ile

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Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	His	Tyr	Phe	Gly	Ser	Met	Pro	50	55	60
Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	65	70	75
Asn	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	85	90	95
Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	100	105	110
Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	115	120	125
Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	130	135	140
Leu	Arg	Ala	Met	Ala	Gln	Gly	Ala	Glu	Ala	Arg	Lys	Pro	Leu	Asp	Leu	145	150	155
Thr	Glu	Glu	Leu	Leu	Lys	Trp	Ala	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	165	170	175
Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	180	185	190
Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	195	200	205
Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	210	215	220
Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	225	230	235
Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	245	250	255
Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile	260	265	270
Lys	Ile	Thr	Lys	Asp	His	Thr	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	275	280	285
Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	290	295	300
Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	Tyr	305	310	315
Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	325	330	335
Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	340	345	350
Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	355	360	365

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 Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp  
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Pro	Asn	Pro	Pro	Ser	Pro	Xaa	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His	Xaa	35	40	45	
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Xaa	Ile	Asp	Leu	Ser	50	55	60	
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Xaa	Xaa	Phe	Gly	Ser	Met	Pro	Thr	65	70	75	80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Xaa	Xaa	85	90	95	
Glu	Ala	Thr	Ser	Phe	Xaa	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Xaa	Arg	Xaa	100	105	110	
Leu	Thr	Tyr	Asp	Xaa	Xaa	Val	Ala	Xaa	Xaa	Pro	Xaa	Gly	Pro	Tyr	Trp	115	120	125	
Xaa	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Xaa	Asn	Ala	Thr	Thr	130	135	140	
Val	Asn	Xaa	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Xaa	Leu	145	150	155	160
Arg	Xaa	Met	Ala	Gln	Xaa	Ala	Glu	Ala	Xaa	Lys	Pro	Leu	Asp	Xaa	Thr	165	170	175	
Glu	Glu	Leu	Leu	Lys	Trp	Xaa	Asn	Ser	Thr	Xaa	Ser	Met	Met	Xaa	Leu	180	185	190	
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	195	200	205	
Xaa	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Xaa	Pro	Leu	Lys	Xaa	Leu	210	215	220	
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	225	230	235	240
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Xaa	Ile	Val	Arg	245	250	255	

Arg	Arg	Xaa	Asn	Gly	Glu	Xaa	Xaa	Glu	Gly	Glu	Xaa	Ser	Gly	Val	Xaa		
			260					265					270				
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Xaa	Glu	Ile	Lys		
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Gly	Xaa	Asp	Ser	Thr	Ala	Xaa	Xaa	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu		
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Ile	Asn	Asn	Pro	Xaa	Val	Leu	Xaa	Xaa	Ala	Arg	Glu	Glu	Xaa	Tyr	Ser		
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Val	Val	Gly	Lys	Asp	Xaa	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu		
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Cys	Pro	Gly	Val	Xaa	Leu	Ala	Thr	Ser	Gly	Xaa	Ala	Thr	Leu	Leu	Ala		
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